

ABSTRACT OF THE DISCLOSURE

Disclosed is a method for forming a capacitor of a semiconductor device. The forming method comprises the step
5 of forming an interlayer insulating film on a semiconductor substrate formed with a bit line. A contact plug to be in contact with the substrate is formed within the interlayer insulating film. A storage electrode is formed on the interlayer insulating film in such a manner that the storage
10 electrode comes in contact with the contact plug. A dielectric film composed of a single composite film of $\text{Ta}_2\text{O}_5(\text{X})\text{Y}_2\text{O}_3(1-\text{X})$ is also formed on the storage electrode according to ALD (Atomic Layer Deposition) technology. A diffusion barrier film is deposited on the dielectric film,
15 and a plate electrode is formed on the diffusion barrier film. The present invention can provide a capacitor having sufficient capacitance necessary for a stable device operation by applying the $\text{Ta}_2\text{O}_5(\text{X})\text{Y}_2\text{O}_3(1-\text{X})$ single composite film to the dielectric film.